



U.S. Fish & Wildlife Service

## Arizona Fishery Resources Office

### *FY 2003 Annual Report*



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*The Arizona Fishery Resources Office believes in cooperative efforts among partners to help ensure the long-term success of aquatic species and habitat conservation and management efforts.*

# ***FY 2003 Annual Report***

(October 1, 2002 – September 31, 2003)

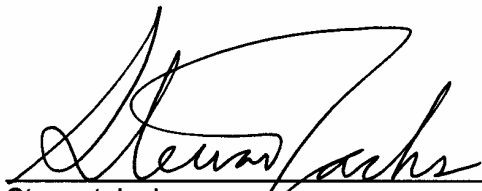
## **U.S. Fish and Wildlife Service Arizona Fishery Resources Office**

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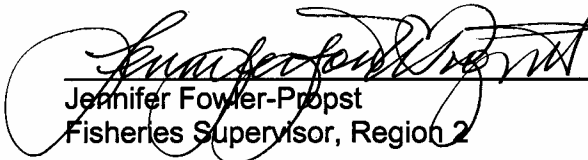
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February 2004

Document Number: USFWS-AZFRO-PT-04-006

  
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## ***Acknowledgements***

Fiscal Year 2003 would not have been a success if it weren't for the dedication and hard work of all members of the AZFRO team including Administrative Support staff, Biological Technicians, Fishery Biologists, Project Coordinators, and the Assistant Project Leader and Project Leader. Thank you to the many partners that we worked with throughout the past year, all of which helped us achieve the accomplishments found within this report. A special thanks to Leslie Thompson and Shelley Simmonds, AZFRO Administrative Officers, and Brenda Brouder, AZFRO Fishery Biologist, for their invaluable "behind the scenes" assistance, without which there would be much less to report. Also, thank you to Rob Simmonds, Assistant Project Leader, for his assistance with conceptualizing the "new look" of our annual report and his overall interest in making it better. Thank you to those within AZFRO that contributed accomplishments and photos for inclusion in this report. Lastly, thank you to those within AZFRO, Jennifer Fowler-Propst, and Craig Springer for reviewing and improving upon this report.



## Executive Summary

We compiled an impressive list of accomplishments during 2003, but have only scratched the surface with regards to recovery of threatened and endangered fish in Arizona. During the past year, we committed resources to 5 of the 19 proposed, threatened, or endangered fish, while the remaining 14 had little or none of our resources devoted to them. Only a few of the additional 15 non-listed native fish received resources devoted to their conservation. While 84 watersheds exist in the state, we were only able to commit resources in 9 of them. However, we fully understand that additional resources need to be committed to all watersheds and native fish. We are excited about the future because we are identifying the needs of Arizona's native fish (**Appendix A**) and are prioritizing the watersheds that we will be working in. However, we remain cautiously optimistic as we move forward because we have yet to secure the additional funding (**Appendix B**) and staff necessary to truly make a difference or "move the needle." In addition to conserving and recovering Arizona's native fish, we were committed to devoting resources to the many Native American Tribes in Arizona by providing technical fishery assistance in support of the conservation and management of Tribal recreational fishing programs and non-game, native fish.

In 2003, we participated in numerous meetings to strengthen existing and to establish new partnerships, both of which enabled us to be more effective in our conservation efforts. We monitored the population status of threatened Apache trout, and endangered Gila topminnow, humpback chub, razorback sucker, and bonytail. In support of public use of Arizona's fishing opportunities, we coordinated the stocking of over 1 million cold and warmwater fish on Tribal lands, participated in radio interviews, drafted news releases and magazine articles, and were featured in ESPN's *Cumberland Stories* outdoor show on Apache trout. We cooperated with Native American Tribes by promoting sport fishing on Tribal lands, providing training in fish sampling, designing databases and assisting Tribes with database management, designing creel surveys, and implementing aquatic habitat surveys. We were leaders in science and technology by implementing and evaluating Basin-wide Visual Estimation Techniques as part of our Apache trout surveys, modeling populations of endangered humpback chub in the Little Colorado River to evaluate effects of recovery actions, evaluating the success of hatchery-produced fish in meeting management objectives identified in Tribal fish management plans, and prioritizing watersheds to guide our future work within the state. We worked with our partners to improve habitat conditions for Apache trout in the White Mountains of eastern Arizona by constructing barriers. We also removed invasive salt cedar on the San Carlos Apache Reservation for the benefit of endangered Gila topminnow, and managed newly created backwater habitats along the lower Colorado River to assist with the recovery of endangered razorback sucker and bonytail. Lastly, we completed 13 technical reports (**Appendix C**), gave over 30 presentations (**Appendix D**), completed over 20 courses and taught 7 courses so that we and our partners could remain effective and efficient in our daily activities.



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Little Colorado River, Grand Canyon, AZ.

## Introduction

The Arizona Fishery Resources Office (AZFRO) is part of the U.S. Fish and Wildlife Service's (Service) Southwest Region (Region 2), which includes Arizona, New Mexico, Texas, and Oklahoma. AZFRO is one of 64 Fishery Resources Offices located across the country, and along with 70 National Fish Hatcheries, 9 Fish Health Centers, and 7 Fish Technology Centers makes up the U. S. Fish and Wildlife Service's Fisheries Program.

**Office:** AZFRO comprises 4 offices, with our headquarters located in Pinetop and satellite offices in San Carlos, Parker, and Flagstaff. Once 3 offices (Pinetop and San Carlos have always been combined), all offices in Arizona have been brought under one umbrella. We believe that this results in better coordination, more collaboration, and more efficient use of Federal resources and employee talents, which translates into better conditions for the fish and habitats we conserve and manage.

**Expertise:** The talents and expertise of AZFRO's employees are as diverse as Arizona's landscape. Our staff is knowledgeable and experienced in the areas of administrative assistance, amphibian and reptile ecology, aquatic ecology, budget and finance, contaminants, database design and management, ecosystem management, fish ecology, geographic information system (GIS), grant writing, ichthyology, population dynamics and modeling, public outreach and education, sportfish management, statistical procedures and analyses, and stream, riparian, and watershed restoration (**Appendix E**).

**Challenges:** Since the settling of the West by pioneers in the early 1880s, native fish populations have disappeared, diminished, or become isolated. In Arizona, 95% of the rivers have been altered by dams, water diversion projects, urban encroachment, cattle grazing, and excessive ground water pumping, or converted to agricultural lands. These activities have resulted in the loss of more than 90% of riparian habitat. In addition, at least 100 species of non-native fish have been either intentionally or inadvertently introduced into Arizona's waters. As a result of habitat fragmentation and destruction and introductions of non-native fish, 1 of the 35 fish species native to Arizona is extinct and approximately 75% are federally listed as threatened or endangered, proposed for listing, or a candidate for listing. In addition to native fish conservation needs, supporting sport fishing programs is an important aspect of what we do. In 2001, 419,000 people 16 years or older fished in Arizona and spent \$336 million on fishing related expenses. The overall economic impact of these expenditures was more than \$1.1 billion.

**Mission and Goals:** AZFRO'S mission is to "work with others to conserve, protect, and enhance fish and other aquatic organisms and their habitats in Arizona." Our daily activities are driven by 3 primary focus areas or goals and include Aquatic Species Conservation and Management, Aquatic Habitat Conservation and Management, and Cooperation with Native American Tribes. AZFRO is the U.S. Fish and Wildlife Service's lead station for recovery of threatened and endangered fish including Apache trout and Little Colorado spinedace, and also works with loach minnow, Gila topminnow, and the "big river" fish such as razorback sucker, humpback chub, and bonytail that inhabit the Colorado River. Our recovery efforts include renovating streams and other aquatic habitats inhabited by non-native fish species that out-compete and often prey upon native fish. Additional efforts include constructing barriers to prevent upstream migration of non-native species, replicating native fish populations into suitable habitat (either natural or man-made), restoring fish passage to previously inaccessible habitat, and monitoring native fish populations. Last, but certainly not least, we cooperate with our Tribal partners by providing technical fishery assistance in support of sport fishing programs, and conserving and recovering native aquatic species and their habitats found on Native American reservations.

**Vision:** In 2002, the Fisheries Program developed a *Vision for the Future*, which identified 7 Focus Areas that our future goals, objectives, and activities will focus on. These Focus Areas are: **Partnerships and Accountability, Aquatic Species Conservation and Management, Public Use, Cooperation with Native Americans, Leadership in Science and Technology, Aquatic Habitat Conservation and Management, and Workforce Management.** The complexity and diversity of our accomplishments in 2003 encompassed all 7 Focus Areas. For brevity's sake, we included each accomplishment only once, even though it may have fit into several focus areas. For example, most of our accomplishments had an element of "Partnerships and Accountability" but this was only the major focus of a couple of accomplishments.

## Partnerships and Accountability



Roger Sorenson

*Partnerships are essential for effective fisheries conservation. Many agencies, organizations, and private individuals are involved in fisheries conservation and management, but no one can do it alone. Together, these stakeholders combine efforts and expertise to tackle challenges facing fisheries conservation. The success of these partnerships will depend on strong, two-way communications and accountability.*

*Federal, State, Tribal, NGO, and private partners meet to strategize cooperative efforts for the benefit of fishery resources throughout the state.*

### AZFRO Coordinates 2<sup>nd</sup> - Annual Statewide Fisheries Coordination Meeting

AZFRO personnel coordinated and hosted the 2<sup>nd</sup> - Annual Arizona Fisheries Coordination Meeting, which is held to discuss fishery resource activities, accomplishments, and needs in Arizona and the Southwest. This meeting brings together a diverse group of fishery professionals from many programs (i.e., management, hatcheries, fish health, Federal Aid, etc.) and agencies (Federal, State, NGO's, etc.). The Arizona Fishery Coordination Meeting allows AZFRO to annually communicate our capabilities and commitment to conserving, protecting, and restoring fish and other aquatic species and their habitats. In addition, the meeting provides an excellent opportunity to build or maintain much needed relationships with our partners and, results in increased collaboration and sharing of resources.

### AZFRO Organizes Congressional Outreach Event

Congressional staffers Shari Farrington (Dist. 2 – Rep. Trent Frank's Office) and Bruce Raden (Dist. 3 – Rep. John Shadegg's Office) attended a congressional outreach event organized by AZFRO and held at the Willow Beach National Fish Hatchery to learn about endangered species, the Colorado River, and the roles of the Fish and Wildlife Service, Arizona Game and Fish Department and others in the recovery of razorback sucker, bonytail, and other fish. The highlight of the event was a boat ride up river to release razorback sucker that had been raised at the hatchery. This event was another step in building and strengthening the Service's relationship and communication with Arizona's representatives in Congress.



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*Congressional staffers Shari Farrington (Dist. 2 – Rep. Trent Franks' Office) and Bruce Raden (Dist. 3 – Rep. John Shadegg's Office) assist State and Federal biologists with stocking endangered razorback sucker into the lower Colorado River.*



## **AZFRO and White Mountain Apache Tribe Host Partners for Fish and Wildlife Annual Meeting**

AZFRO and the White Mountain Apache Tribe hosted the Regional Partners for Fish and Wildlife Program annual meeting, which included 45+ attendees from the 4-state region (AZ, NM, OK, and TX), the Service's Washington Office, the Department of the Interior, the Secretary of the Interior's Office, Congressional staffers, Arizona Game and Fish Department, and San Carlos Apache Tribe. The meeting is held annually to review and evaluate program accomplishments throughout the Southwest Region. Meeting participants were also given a tour of the Alchesay-Williams Creek National Fish Hatchery Complex and visited an Apache trout barrier on Little Diamond Creek that was constructed with Partners for Fish and Wildlife Program dollars.



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*Partners meet to review and evaluate Partners for Fish and Wildlife Program projects.*

## **AZFRO Administers Partners for Fish and Wildlife Program to Tribes**

AZFRO administered a little over \$26,000 in Partners for Fish and Wildlife Program grants to Native American Tribes for conservation and restoration of federal trust species. AZFRO personnel participated in the selection process for FY 2003 and FY 2004 funding of statewide projects and completed Private Lands Agreements, Section 7 consultations, and HABITS Forms on several projects on the Fort Apache Indian Reservation. AZFRO personnel also assisted with the implementation of projects funded through the Partners for Fish and Wildlife Program.



## **AZFRO Builds and Strengthens Partnerships and Recovery Efforts**

AZFRO personnel participated in numerous scientific, technical, recovery, and workgroup meetings, all of which provided excellent opportunities for both information exchange and building or improving of relationships. Those meetings included Colorado River Aquatic Biologists, Native American Fish and Wildlife Society, American Fisheries Society, Desert Fishes Council, Upper Colorado River Researchers Review, Apache Trout/Little Colorado Spinedace Recovery Team, Loach minnow/Spikedace Conservation and Assessment Team, and others. AZFRO personnel presented 17 papers at these meetings in FY 2003.

## **AZFRO Refines the Way They Do Business**

Efforts to become more efficient and effective at how we conduct business continued in FY03 with a great deal of progress being made toward developing the framework for how AZFRO 1) identifies projects, 2) sets priorities, 3) develops projects, and 4) completes projects. We started by meeting with our partners, reviewing recovery and management plans, and developing a list of potential projects for the year. We then convened to develop ranking criteria to prioritize the projects. High ranking projects were discussed to evaluate project merits, define objectives, and develop methodologies. Eventually the projects were compiled into an annual work plan that made the most efficient use of the staff, equipment, and other resources available to AZFRO. Projects that ranked high but did not make the annual work plan due to insufficient funds were converted into grant proposals and submitted for funding.

## Aquatic Species Conservation and Management

### Endangered Gila Topminnow Population Estimates Completed at Bylas Springs

AZFRO with help from San Carlos Youth Conservation Corps students, conducted depletion surveys to determine the current status of the endangered Gila topminnow at a series of 3 springs (Bylas Springs) located on the San Carlos Apache Indian Reservation. Bylas Springs is one of only 14 remaining locations of Gila topminnow in the state of Arizona. Over the past decade, Bylas Springs and the Gila topminnow have received a lot of attention in the form of spring renovations, Gila topminnow reintroductions, and construction of artificial habitat and barriers in an effort to ensure this unique desert species' longevity.

*The Fisheries Program maintains and implements a comprehensive set of tools and activities to conserve and manage self-sustaining populations of native fish and other aquatic resources. These tools and activities are linked to management and recovery plans that help achieve restoration and recovery goals, provide recreational benefits, and address Federal trust responsibilities. Sound science, effective partnerships, and careful planning and evaluation are integral to conservation and management efforts.*



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*The endangered Gila topminnow.*



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*Artificial habitat constructed for the endangered Gila topminnow.*

### Endangered Humpback Chub "Take to the Air" in Search of a New Home

AZFRO, with the help of a helicopter, translocated 283 juvenile humpback chub to upstream areas of the Little Colorado River, AZ, on the Navajo Nation near Grand Canyon National Park. The Little Colorado River is already home to humpback chub; however, due to a reduction in their historical range they are currently only found in the lower 14 km of the river. Biologists believe that upstream sections could provide habitat for humpback chub due to their perennial flow and abundant food resources. This translocation effort was identified as a voluntary conservation measure in the 2002 Biological Opinion regarding experimental releases from Glen Canyon Dam, and was undertaken in hopes of increasing humpback chub recruitment to adulthood by allowing translocated fish to take advantage of abundant food resources, warm water temperatures, and reduced competition and predation by the fewer large-bodied non-native fish in this area.

*Endangered humpback chub being moved to their new home in the Little Colorado River.*



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## Stock Assessment Completed on Endangered Humpback Chub in the Little Colorado River

One of the primary responsibilities of AZFRO is to monitor humpback chub populations within the Little Colorado River, Navajo Nation, AZ, near Grand Canyon National Park. In FY 2003, AZFRO completed 4 stock assessment and monitoring trips with help from Arizona Game and Fish Department and SWCA, Inc. personnel, along with several volunteers. The primary goal of this effort is to collect trend data based on population estimates of humpback chub during the spring spawning event in the Little Colorado River, and again in the fall. These yearly population estimates are crucial in tracking population dynamics of this endangered fish within the Little Colorado and Colorado rivers in the Grand Canyon.



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*Hoop nets are used to capture humpback chub in the blue waters of the Little Colorado River.*

## Recovery Efforts Continue in FY 2003 for Threatened Apache Trout



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*Apache trout surveys on a beautiful fall day in the White Mountains of AZ.*

AZFRO is the Service's lead station for recovery efforts for the threatened Apache trout, and efforts leading toward recovery continued throughout FY 2003. AZFRO assisted the White Mountain Apache Tribe's Wildlife and Outdoor Recreation Division with the reconstruction of 2 gabion barriers, which were made possible through a Partners for Fish and Wildlife grant awarded to the White Mountain Apache Tribe. In addition, we completed habitat and Apache trout surveys of 5 streams, evaluated existing barriers on 5 streams, and replicated 2 extant Apache trout populations into restored habitats. AZFRO also assisted the Arizona Game and Fish Department in renovating 2 streams on the Apache-Sitgreaves National Forest for future introductions of Apache trout. AZFRO coordinated the 2<sup>nd</sup> - Annual Apache Trout Work Week where personnel from the U.S. Fish and Wildlife Service, U.S. Forest Service, White Mountain Apache Tribe, and Arizona Game and Fish Department completed 6 miles of fish surveys on the West Fork Black River. Lastly, AZFRO, along with all partners involved in Apache trout recovery efforts, accepted a Trout Unlimited/National Fish and Wildlife Foundation grant totaling \$205,000 to be used toward implementing recovery activities.

## AZFRO Leads Management Planning Effort for Big-River Fish of the Lower Colorado River Basin

AZFRO led an inter-agency, *Recovery Implementation Plan/Scientific Work Group* in the drafting of a management plan for the big-river fish of the lower Colorado River Basin. The plan presents management suggestions for big-river fish populations in the lower Colorado River Basin and is meant to complement the recent recovery goals developed by the Service's Region 6 Office. The many agencies contributing to the successful drafting of this document included the U.S. Fish and Wildlife Service, U.S. Geological Survey, U.S. Bureau of Reclamation, National Park Service, Arizona Game and Fish Department, California Department of Fish and Game, Nevada Department of Wildlife, Arizona State University, Northern Arizona University, University of Nevada-Las Vegas, University of Oklahoma, and Colorado State University.

## Razorback and Bonytail “Round-up” Continues on Lakes Mojave and Havasu

AZFRO completed annual efforts to “round-up” endangered razorback sucker and bonytail in lakes Mojave and Havasu, both of which are located along the lower Colorado River below Hoover Dam. The annual round-up is a multi-agency effort to assess the status of wild and introduced populations in both lakes using mark-recapture techniques. In addition to assessing the population status, wild bonytail are collected for possible inclusion into the bonytail broodstock maintained at the Service’s Dexter National Fish Hatchery and Technology Center. Over a 5-week period constituting round-up and broodstock collection efforts, 90 razorback suckers were collected in Lake Mojave, 34 of which were recaptured fish and 19 that had been collected as larvae, raised to a larger size in refugia, tagged, and released back into Lake Mojave. An additional 19 razorback sucker were collected in Lake Havasu. Only 1 large bonytail was captured in Lake Mojave for possible inclusion into the broodstock and 5 additional bonytail were recaptured in Lake Havasu, representing fish stocked in previous years as part of the Lake Havasu Fisheries Improvement Project. The 5-week effort to round-up fish in 2003 was partially supported by funds received from the National Fish and Wildlife Foundation through the Multi-Species Conservation Plan. In addition to rounding-up fish, AZFRO personnel assisted the Willow Beach National Fish Hatchery with caring for eggs and larvae that will eventually be introduced into the wild or used as broodstock.



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Rob Simmonds, AZFRO-Pinetop, prepares razorback sucker eggs for in vitro fertilization in conjunction with the Razorback roundup.

### Public Use



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As the population in the United States continues to grow, the potential for adverse impacts on aquatic resources, including habitat will increase. At the same time, demands for responsible, quality recreational fishing experiences will also increase. The Service has a long tradition of providing opportunities for public enjoyment of aquatic resources through recreational fishing, habitat restoration, and education programs and through mitigating impacts of Federal water projects.

Tribal waters in AZ receive largemouth bass and channel catfish from Inks Dam National Fish Hatchery located in TX.

## AZFRO Coordinates Fish Stocking in Support of Tribal Recreational Fishing Programs

AZFRO, in cooperation with Alchesay-Williams Creek National Fish Hatchery Complex and Inks Dam National Fish Hatchery, coordinated and assisted with the stocking of approximately 126,994 native Apache trout, 112,700 brook trout, 82,600 brown trout, 8,500 cutthroat trout, 679,180 rainbow trout, 5,000 largemouth bass, and 35,000 channel catfish into waters located on 8 Indian Reservations in Arizona and New Mexico. Tribal recreational fishing programs generate a significant amount of revenue from the sale of fishing, boating, and camping permits.

Happy young anglers with an impressive days catch!



Wynne Stowers



## AZFRO Assist Army Corps of Engineers with Monitoring Water Quality

AZFRO, through a contract with the Army Corps of Engineers, continued to collect water quality data along with bacteriological samples from Alamo Lake in southwestern Arizona. The Arizona Game and Fish Department uses these data to manage the largemouth bass and black crappie fishery for Arizona's residents. AZFRO has been conducting water quality and bacteriological sampling at these lakes for over 20 years.

## AZFRO Reaches Out to the Public in Support of Apache Trout Recovery and Tribal Recreational Fishing Programs

AZFRO reached a potential 70 million viewers through ESPN's *Cumberland Stories* outdoor TV show, which focused on historic and current management of the threatened Apache trout and recovery potential of the species. Interviews were conducted with federal, state, tribal, and NGO partners involved in the recovery program, which resulted in national awareness of the ongoing successful partnerships that are contributing to the recovery of native Apache trout in Arizona. Special thanks go out to Mamie Parker, Assistant Director, Fisheries and Habitat Conservation, and Craig Springer, Region 2 Fishery Biologist, for making this happen. In addition, AZFRO personnel prepared numerous popular magazine and website articles and monthly fishing reports for the media highlighting the sport fishing opportunities on Tribal lands. In addition to writing popular articles, we participated in radio, television, and newspaper interviews.

*ESPN's Cumberland Stories film crew captures Apache trout survey.*



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## Cooperation with Native Americans



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Dewey Wesley, AZFRO-San Carlos, with an "average size" San Carlos Lake largemouth bass.

Conserving this Nation's fish and other aquatic resources cannot be successful without the partnership of Tribes; they manage or influence some of the most important aquatic habitats both on and off reservations. In addition, the Federal government and the Service have distinct and unique obligations toward Tribes based on trust responsibility, treaty provisions, and statutory mandates. The Fisheries Program plays an important role in providing help and support to Tribes as they exercise their sovereignty in the management of their fish and wildlife resources on more than 55 million acres of Federal Indian trust land and in treaty reserved areas.

## San Carlos Lake Sport Fishery Assessment Completed

San Carlos Lake, located on the San Carlos Apache Indian Reservation, is known for its ability to produce state-record, trophy largemouth bass and black crappie. AZFRO, with help from San Carlos Recreation & Wildlife Department Game Rangers, conducted three nights of electrofishing surveys on San Carlos Lake and collected over 1,000 largemouth bass and over 100 black crappie. Results of the survey indicate that the largemouth bass population is "balanced" based on good proportions of both small (young) and large (old) bass being collected. Similar to the largemouth bass population, the population of black crappie is considered "balanced."



## Effects of Coolidge Dam Operations on San Carlos Lake Largemouth Bass Fishery Investigated

AZFRO completed analyses of a 5-year largemouth bass/reservoir hydrology dataset to assist the San Carlos Apache Tribe in determining the effects past operations of Coolidge Dam have had on the resident largemouth bass fishery in San Carlos Lake. In any given year, fluctuations in lake elevation can exceed 15 vertical feet as a result of water releases for downstream irrigation of agricultural fields. Results of the analyses were presented to the Tribe in addition to recommendations for future operations from Coolidge Dam that are more “fish friendly” than past operations.

*Coolidge Dam, San Carlos Lake, AZ. Notice the low water levels. San Carlos Lake is currently at 3% of its capacity.*



## AZFRO Works with Tribe to Develop a San Carlos Apache Tribe Fish Management Plan

AZFRO completed and submitted a draft San Carlos Fish Management to the San Carlos Apache Tribe's, Recreation and Wildlife Department. The Fish Management Plan identifies goals, objectives, and actions necessary for the continued conservation and management of recreational sport fisheries and native, threatened, and endangered fish located on the reservation. The completion of this 5-year Fish Management Plan is a cooperative effort between AZFRO, San Carlos Recreation and Wildlife Department, and the San Carlos Apache Tribe.

## AZFRO Assists Tribe in Developing an Angler Creel Survey

AZFRO assisted the White Mountain Apache Tribe, Wildlife and Outdoor Recreation Division with the development of an angler creel survey to begin quantifying angler use, success, and harvest rates on recreational fishing lakes located on the Fort Apache Indian Reservation. The White Mountain Apache Tribe's recreational fishing program generates a substantial source of revenue from the sale of fishing, boating, and camping permits, while at the same time providing anglers with an opportunity to catch trophy rainbow, brown, and Apache trout. In fact, the AZ state record brown trout (23 lbs, 36 in) was caught from Reservation Lake located on the Fort Apache Indian Reservation.



*Angler with a stream-caught native Apache trout.*

## AZFRO Assists with Surveys of Fort Apache Indian Reservation Lakes

AZFRO and White Mountain Apache Tribe, Wildlife and Outdoor Recreation Division personnel completed spring surveys of 5 high-elevation trout lakes located on the Fort Apache Indian Reservation to evaluate the fish community found within each lake and where feasible, develop recommendations for future management of each species found within. Each lake is stocked with varying combinations of trout species and managed as put-and-take, put-grow-and-take, and/or “trophy” catch and release depending upon lake-specific management goals.



*State record brown trout (23 lbs, 36 in) caught on Fort Apache Indian Reservation.*

## AZFRO Assists with Surveys of Navajo Nation Lakes and Streams

AZFRO assisted the Navajo Department of Fish and Wildlife in collecting baseline fishery data on several lakes and streams located on the Navajo Nation. In addition to collecting baseline data, AZFRO compared and contrasted differences among the lakes and streams sampled to assist the Tribe in developing lake/stream-specific recommendations for future management. While the lakes on the Navajo Nation support non-native recreational fishing programs, the streams are home to native bluehead sucker and speckled dace.

*Cutthroat trout is one of several trout species stocked in waters located on the Navajo Nation.*



## Leadership in Science and Technology



*The endangered humpback chub.*

*Science and technology form the foundation of successful fish and aquatic resource conservation and are used to structure and implement monitoring and evaluation programs that are critical to determine the success of management actions. The Service is committed to following established principles of sound science.*

## Study Underway to Determine Effects of Repeated Fish Handling on Endangered Humpback Chub

AZFRO is responsible for monitoring endangered humpback chub populations within the Little Colorado River, Navajo Nation, AZ, near Grand Canyon National Park. Current and past monitoring and research activities often include initially capturing and tagging fish and then subsequently recapturing the same fish numerous times to generate population estimates. In FY 2003, AZFRO began assessing the effects of repeated handling on growth, condition, and survival of humpback chub, using bonytail as a surrogate. Preliminary results indicate that fish that were repeatedly handled weighed less than fish not handled however, there was no difference in length. Handling fish is inevitable and essential to understanding population dynamics; however, researchers should make every effort to minimize the effects of sampling on fish. By taking a close look at our methods and the time each step takes, we hope that this study will help identify field techniques that will help reduce handling stress in imperiled fish.

## AZFRO Evaluates the Effectiveness of Aerators on Improving Summer Survival of Stocked Trout

AZFRO completed a report summarizing the effects of the installation of aerators on summer water quality conditions in an attempt to improve summer survival of spring-stocked rainbow and brown trout. In this study, water quality parameters were measured before and after the installation of aerators. Results of the study indicate that aerators were effective in improving water quality conditions immediately adjacent to the aerator, but that little improvement in water quality over the entire lake was observed.

*Aerator installed at Point of Pines Lake in an effort to improve over summer survival of trout.*





## Estimates of Survival and Growth of Different Strains and Sizes of Stocked Trout Completed

AZFRO completed the collection and analyses of data pertaining to the evaluation of overwinter survival and growth of different strains and sizes (sub-catchable vs. catchable) of stocked rainbow and brown trout in an effort to determine the most cost-effective means of providing a recreational trout fishery (put-and-take vs. put-grow-take). Approximately 22,000 trout were fin clipped prior to stocking thanks to the assistance of personnel from the Alchesay-Williams Creek National Fish Hatchery Complex. After stocking in late-fall, monthly sampling to recapture marked fish began. Based on changes in total length and number of fish captured during each survey, monthly growth and survival rates were calculated for each size and strain of fish stocked.

*Mark Brouder and Dewey Wesley, AZFRO-San Carlos, mark fish prior to stocking.*



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9.24.2003

## Feasibility of Augmenting the Humpback Chub Population Within the Colorado River, Grand Canyon, Investigated

AZFRO examined the feasibility of 3 potential management actions to augment the existing population of endangered humpback chub within the Colorado River, Grand Canyon. Potential management actions include: 1) developing a captive broodstock for humpback chub, 2) establishing a supplemental stocking program for humpback chub using wild-caught age-0 fish removed from the Little Colorado River and grown to a larger size in captivity, and 3) establishing a second, or expand the current population of humpback chub. The final report generated from this effort lists and discusses in detail the potential risks and benefits that may result from each of these potential management actions.

*The Little Colorado River is the major spawning ground for the endangered humpback chub in Grand Canyon.*

## Apache Trout Replication Strategies Provided to Apache Trout Recovery Team

AZFRO and the Arizona Game and Fish Department completed and submitted a report outlining recommendations for replication of Apache trout populations to the Apache Trout Recovery Team. This report was drafted in response to proposed changes to the existing strategy for extant Apache trout populations. Several of the recommendations include efforts to interconnect populations, ensure each Apache trout lineage has at least one population that contains 250 adult fish, and ensure replicated populations are geographically separated from extant populations.

*White Mountain Apache Tribal Fishery Technician releases Apache trout into a "new" (renovated) stream on the Fort Apache Indian Reservation.*

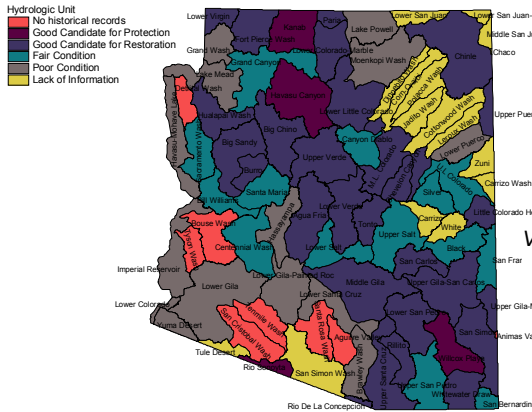


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## AZFRO Prioritizes Watersheds to Assist in Determining Future Conservation Efforts

Arizona's diverse landscape and arid environment provide many opportunities for watershed-level restoration efforts that are integrated with the riparian/aquatic interface. AZFRO completed the first of several phases by developing a watershed-level Index of Biotic Integrity (IBI) using several biological matrices [e.g., % species at risk, number of native fish species present (historic, current, and % intactness), and native ranid frog abundance] for Arizona's 84 watersheds. This IBI and subsequent ranking identifies watersheds with the greatest conservation potential and will help AZFRO and others develop strategies that can be used to focus restoration/monitoring within the state of Arizona. The second phase of this project will examine relationships between a full suite of land- and water-use parameters (e.g., number of dams, roads, wells, etc.) and watershed IBI score.



Varying degrees of conservation potential exist among Arizona's 84 watersheds.

## Aquatic Habitat Conservation and Management

### Invasive Salt Cedar Removed to Improve Riparian Habitat for Endangered Gila topminnow

AZFRO, along with a Youth Conservation Corps (YCC) crew comprised of San Carlos Tribal teens, removed invasive salt cedar along an approximate 100-meter stretch of riparian corridor along Salt Creek, AZ, located on the San Carlos Apache Indian Reservation. The removal of salt cedar is one aspect of a restoration effort to improve aquatic habitat conditions for the endangered Gila topminnow. Invasive salt cedar is known for its ability to consume large quantities of water (~50 - 100 gallons/day/tree), water that is considered "gold" in the arid southwest, and for out competing native cottonwood and willow trees.

*Loss and alteration of aquatic habitats are principal factors in the decline of native fish and other aquatic resources and the loss of biodiversity. Seventy percent of the Nation's rivers have altered flows, and 50 percent of waterways fail to meet minimum biological criteria.*



YCC crew improves aquatic habitat conditions for endangered Gila topminnow by removing invasive salt cedar.



The YCC is a summer employment program sponsored by the US Departments of the Interior and Agriculture for young males and females ages 15 through 18 to work, learn, and earn together by working on projects, projects with a stated purpose of developing and maintaining natural resources for the American people.

## Backwater Habitats Along Lower Colorado River Renovated to Provide Home for Razorback Sucker

AZFRO renovated several Ducks Unlimited ponds located on the Imperial National Wildlife Refuge to improve habitat conditions for endangered “big-river” fish by removing non-native fish species. Once the renovation was complete, approximately 700 fingerling razorback sucker were introduced into the ponds. Monitoring of the water quality and growth and survival of stocked razorback sucker continues to date. In the future, endangered bonytail are also planned for stocking into these newly created habitats. The overall goal of this project, which was identified as a “reasonable and prudent alternative” in the 1997 Biological Opinion regarding on Lower Colorado River Operations and Maintenance: Lake Mead to Southerly International Boundary, is to maintain these backwater habitats with self-sustaining populations of both razorback sucker and bonytail. This project, which is beginning its second year, is funded by the Bureau of Reclamation.



Doug Jann, AZFRO-Parker, releases endangered razorback suckers into their new home

### Workforce Management

#### AZFRO Biologists Complete Details to the Washington Office

Mark Brouder and Rob Simmonds were afforded the opportunity to complete a detail to the Washington Office, working on a “Management Analysis” of the Fish and Wildlife Management Assistance (FWMA) component of the Fisheries Program. Mark also had the opportunity to engage in other activities such as attending a Senate Sub-committee hearing on Tribal Natural Resources, FWMA Program Activity Based Costing, FY 2005 DOI Budget Briefing, and developing a “Fact Sheet” capturing FWMA Program activities and accomplishments with regards to Tribal Assistance. Rob took advantage of numerous opportunities to meet with staff from a number of Service programs and participate in a number of meetings including Fish and Habitat Conservation strategic planning and an informal discussion with Mamie Parker, Assistant Director, Fisheries and Habitat Conservation. Rob also met with staff from every Congressional Office from Arizona to discuss the Fisheries and Habitat Conservation program from a National perspective, including Fish Passage, Aquatic Invasive Species, and the *Vision for the Future*. From an Arizona perspective, Rob discussed a few of the major issues we face, such as blocking exotic species and restoring habitats.

*The Fisheries Program relies on a broad range of professionals to accomplish its mission: biologists, managers, administrators, clerks, animal caretakers, and maintenance workers. Without their skills and dedication, the Fisheries Program cannot succeed. Employees must be trained, equipped, and supported in order to perform their jobs safely, often under demanding environmental conditions, and to keep current with the constantly expanding science of fish and aquatic resource management and conservation.*

#### AZFRO Personnel Successfully Completed and Provided Training

AZFRO believes in and supports continuing education and training for all personnel, so that we can continue to be a strong leader in the conservation and management of our Nation’s aquatic resources and habitats. In FY 2003, AZFRO personnel completed over 20 courses including Basics for Supervision, Employee Foundations, Stepping Up to Leadership, MOCC, Use of Rotenone and Antimycin in Fisheries Management, Stream Inventory Techniques, Electrofishing Certification, Pesticide Applicators License, Alternative Dispute Resolution, IT Security, Financial Fundamentals, Financial Transaction Processing, Simplified Acquisition Procedures, Personal Property Management, Dreamweavers/Fireworks Website Design, and Ethics. In addition to completing courses, AZFRO personnel either helped develop or provided training in the areas of Hazard Analysis Critical Control Point (HACCP), B3 Airplane and Helicopter Safety, MOCC, Microsoft Access Database Design, Fish Survey Techniques, and Creel Survey Design, and others.

## Appendix A. AZFRO Fisheries Operating Needs (FONS)

Project Title (Project Duration)	Cost
<b><u>Apache Trout Restoration</u></b>	
Apache Trout Restoration Activities (3 years) .....	\$375,000
Apache Trout Restoration - Barrier Construction	
East Fork of the Little Colorado River (1 year) .....	\$260,000
South Fork of the Little Colorado River (1 year) .....	\$165,000
West Fork of the Little Colorado River (1 year) .....	\$260,000
West Fork Black River (1 year) .....	\$328,000
Apache Trout Restoration - Barrier Re-Construction	
Centerfire Creek (1 year) .....	\$10,000
Fish Creek (1 year) .....	\$10,000
Hayground Creek (1 year) .....	\$50,000
Big Bonito Creek (1 year) .....	\$30,000
Little Bonito Creek (1 year) .....	\$125,000
Apache Trout Restoration - Genetic Tissue Collection and Analysis (5 years) .....	\$66,000
Apache Trout Restoration - Renovation of Candidate Streams (5 years) .....	\$203,000
Apache Trout Restoration - Replication of Pure Apache Trout Populations (5 years) .....	\$56,000
Apache Trout Restoration - Monitoring of Apache Trout Populations (10 years) .....	\$2,000,000
Apache Trout Restoration-Hatchery Management for Apache Trout (10 years) .....	\$900,000
Apache Trout Recreational Angling Program (7 years) .....	\$825,000
<b>Total .....</b>	<b>\$5,663,000</b>
<b><u>Habitat</u></b>	
Habitat Enhancement on Private Lands in Arizona (10 years) .....	\$2,000,000
Management of Backwater Habitats on the Lower Colorado River (5 years) .....	\$638,000
Develop Grow-out Sites for Native Fish in La Paz and Mojave Counties, Arizona (3 years) ..	\$250,000
Healing Our Watersheds - Working with Others (10 years) .....	\$2,000,000
Effects and Restoration Needed Post Rodeo-Chedeski Fire (3 years) .....	\$300,000
<b>Total .....</b>	<b>\$5,118,000</b>
<b><u>Tribal</u></b>	
Tribal Partnerships - Strengthening the Natural Resource Ties (10 years) .....	\$900,000
Improving Recreational Fishing on Service and Tribal Lands (10 years) .....	\$925,000
Angler Access Improvement on the San Carlos Apache Reservation (1 year) .....	\$38,000
Development of Fishery Management Plans on Native American Reservations (2 years) ....	\$165,000
Survey, Map, and Identify Threats to Native Fish on Tribal Lands in Arizona (3 years) .....	\$350,000
Assisting Tribes with Wildlife Management (10 years) .....	\$2,000,000
<b>Total .....</b>	<b>\$4,378,000</b>
<b><u>Invasive Species</u></b>	
Aquatic Nuisance Species Control - Exotic Crayfish Control (10 years) .....	\$150,000
Aquatic Nuisance Species - Bullfrog Control (5 years) .....	\$100,000
Aquatic Nuisance Species - Giant Salvinia Control (5 years) .....	\$200,000
Fishery Field Station - Hazard Analysis Critical Control Plan Development (5 years) .....	\$75,000
Collection of Trout from for Whirling Disease Screening (2 years) .....	\$136,000
Controlling Invasive Aquatic Plants for Improved Fishing & Boating (10 years) .....	\$500,000
Asian Tapeworm Effects on Native Fish in Arizona (7 years) .....	\$105,000
<b>Total .....</b>	<b>\$1,266,000</b>



## Appendix A. (continued)

Project Title (Project Duration)	Cost
<b><u>Big River Fishes Recovery</u></b>	
Site for Second Population of Endangered Humpback Chub (2 years).....	\$185,000
Stocked Endangered Species Evaluation (5 years) .....	\$560,000
Implementation Plan for Endangered Fish of the Colorado River (2 years) .....	\$24,000
Develop Broodstock and Grow-out Sites for Humpback Chub (10 years).....	\$1,500,000
Survey Native Fish on the Lower Colorado River (10 years).....	\$1,000,000
<b>Total .....</b>	<b>\$3,269,000</b>
<b><u>Native Fish</u></b>	
Statewide Native Fish Monitoring (10 years).....	\$770,000
Status And Distribution of Yaqui Trout in Mexico (3 years) .....	\$348,000
Collect Yaqui Sucker for Hatchery Broodstock for Repatriation in Arizona (5 years) .....	\$375,000
Collect Native Fish for Hatchery Broodstock In Arizona (10 years).....	\$1,198,000
Implement Little Colorado River Spinedace Recovery Actions (4 years) .....	\$300,000
Survey Native Fish on the San Carlos Apache Reservation (3 years) .....	\$200,000
Develop Native Fish Refuge at Pipe Springs National Monument (1 year) .....	\$25,000
Implement Desert Pupfish Recovery Actions (10 years) .....	\$750,000
<b>Total .....</b>	<b>\$3,966,000</b>
<b><u>Fish Passage</u></b>	
Loach Minnow Fish Passage Around East Fork Irrigation Diversions, AZ (1 year) .....	\$75,000
Fish Passage on Bonita Creek on the San Carlos Apache Reservation (1 year).....	\$60,000
Fish Passage on Cassadore Springs on the San Carlos Apache Reservation (1 year) .....	\$60,000
Fish Passage on Warm Springs on the San Carlos Apache Reservation (1 year).....	\$60,000
Feasibility Study - Bypass Two Low Dams on Lower Colorado River, AZ (1 year) .....	\$75,000
<b>Total .....</b>	<b>\$330,000</b>
<b><u>Science</u></b>	
Strengthening Our Science (10 years) .....	\$1,100,000
<b>Total .....</b>	<b>\$1,100,000</b>
<b><u>Outreach</u></b>	
Getting The Word Out-Fisheries Program Outreach (10 years).....	\$750,000
<b>Total .....</b>	<b>\$750,000</b>
<b><u>Other</u></b>	
Conduct Annual DOI Motorboat Operator Certification Courses (10 years).....	\$50,000
Contaminant Analysis of Hatcheries and Their Products (2 years) .....	\$240,000
Youth Conservation Corps – Working for the Future (10 years).....	\$1,000,000
<b>Total .....</b>	<b>\$1,290,000</b>
<b>Total FONS.....</b>	<b>\$27,200,000</b>

## Appendix B.

## AZFRO Budget

<b>Fiscal Year 2003 Budget:</b>	Total .....	\$1,375,724
	Ecological Services** .....	\$87,000
	Reimbursables .....	\$459,650
	Partners for Fish & Wildlife.....	\$30,000
	Youth Conservation Corps .....	\$15,000
	Fisheries .....	\$784,074
<b>Fiscal Year 2002 Budget:</b>	Total .....	\$1,041,684
	Ecological Services** .....	\$86,500
	Reimbursables .....	\$270,984
	Partners .....	\$40,000
	Fisheries .....	\$644,200
<b>Fiscal Year 2001 Budget:</b>	Total .....	\$1,057,100
	Ecological Services** .....	\$70,000
	Reimbursables .....	\$260,214
	Partners for Fish & Wildlife.....	\$40,000
	Fisheries .....	\$686,886
<b>Fiscal Year 2000 Budget:</b>	Total .....	\$821,617
	Ecological Services** .....	\$66,700
	Reimbursables .....	\$244,792
	Partners for Fish & Wildlife.....	\$40,000
	Fisheries .....	\$470,125
<b>Fiscal Year 1999 Budget:</b>	Total .....	\$748,823
	Ecological Services** .....	\$66,200
	Reimbursables .....	\$240,000
	Partners for Fish & Wildlife.....	\$40,000
	Fisheries .....	\$402,623

\*\*Ecological Services funding was solely for the support of an Ecological Services biologist stationed in Pinetop.

## Appendix C.

## AZFRO Publications

*The following is a list of technical publications published in FY 2003. Copies of these publications can be obtained by contacting:*

U.S. Fish and Wildlife Service  
Arizona Fishery Resources Office  
P.O. Box 39  
Pinetop, AZ 85935  
(928) 367-1953

- Brouder, B.L. 2003. Evaluation of Fort Apache Indian Reservation Recreational Fishing Lakes. USFWS-AZFRO-PT-03-010.
- Brouder, M.J. 2003. Evaluation of LAS Pond 1 Aerator at Point of Pines Lake. USFWS-AZFRO-SC-03-001.
- Brouder, M.J. 2003. Spring 2003 Fisheries Survey of Fort Apache Fishing Lakes. USFWS-AZFRO-SC-03-003.
- Jacks, L.S. 2003. FY2002 Arizona Fishery Resources Office Annual Report. USFWS-AZFRO-PT-03-011.
- Jann, D.B. 2003. Native Fish Protected Habitats Quarterly Report: First Quarter, FY 2003. USFWS-AZFRO-PA-03-025.
- Jann, D.B. 2003. Native Fish Protected Habitats Quarterly Report: Second Quarter, FY 2003. USFWS-AZFRO-PA-03-041.
- Minckley, C.O. 2003. Capture and Repatriation of Razorback Sucker and Bonytail into Lake Havasu. USFWS-AZFRO-PA-03-015.
- Minckley, C.O. and M. S. Thorson. 2003. Bonytail Broodstock Collection Report Lake Mohave, AZ-NV. USFWS-AZFRO-PA-03-001.
- Sponholtz, P.J. 2003. Stream and Reservoir Sampling on the Navajo Nation, August 2002. USFWS-AZFRO-FL-03-001.
- VanHaverbeke, D.R. 2003. A Proposal to Investigate the Feasibility of Developing a Supplemental Stocking Program and a Captive Broodstock Program for Humpback Chub (*Gila cypha*) in Grand Canyon. USFWS-AZFRO-FL-03-004.
- VanHaverbeke, D.R. 2003. Monitoring Native Fishes in the Colorado River Ecosystem in Grand Canyon 16-27 September and 21 October-1 November 2002, Trip Report. USFWS-AZFRO-FL-03-002.
- VanHaverbeke, D.R. 2003. Monitoring Native Fishes in the Colorado River Ecosystem in Grand Canyon 31 March-11 April and 28 April-9 May 2003, Trip Report. USFWS-AZFRO-FL-03-005.
- VanHaverbeke, D.R. 2003. Stock Assessment and Fisheries Monitoring Activities in the Little Colorado River within Grand Canyon During 2002, Annual Report. USFWS-AZFRO-FL-03-003.



## Appendix D.

## AZFRO Presentations

*The following is a list of presentations given by AZFRO personnel in FY 2003:*

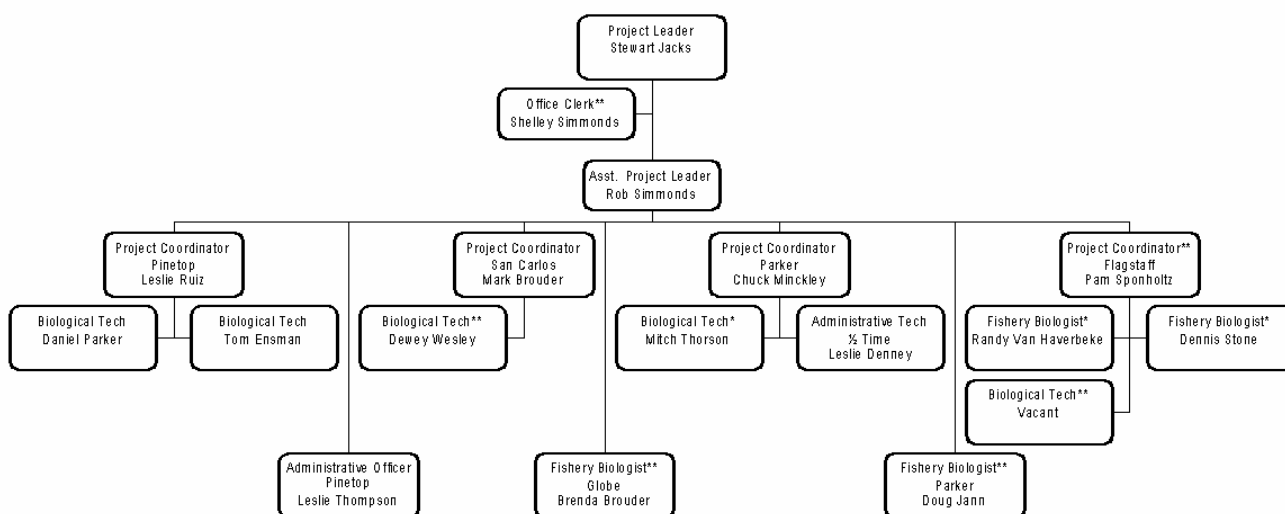
- Brouder, B.L. 2003. Evaluation of Trout Stocking in Fort Apache Indian Reservation Recreational Fishing Lakes. AZ/NM American Fisheries Society Annual Meeting, Gallup, NM.
- Brouder, B.L. and P.J. Sponholtz. 2003. The Arizona Fishery Resources Office's Watershed Prioritization Plan Index of Biotic Integrity. Arizona Fishery Resources Office Annual Biologist's Meeting, San Carlos, AZ.
- Brouder, M.J. 2003. Effects of Dam Operations on Largemouth Bass in a Southwestern Reservoir. AZ/NM American Fisheries Society Annual Meeting, Gallup, NM.
- Brouder, M.J. 2003. Effects of Dam Operations on Largemouth Bass in a Southwestern Reservoir. Western Division American Fisheries Society Meeting, San Diego, CA.
- Brouder, M.J. 2003. The Activities and Projects of the Arizona Fishery Resources Office. U.S. Fish & Wildlife Service Washington Office, Special Staff Meeting, Washington, DC.
- Ensman, T.M. 2002. U.S. Fish & Wildlife Service Careers. Blue Ridge High School, Lakeside, AZ.
- Ensman, T.M. 2003. The Role of the Arizona Fishery Resources Office in Natural Resource Management in Arizona. Annual White Mountain Regional Wildlife Fair, Show Low, AZ.
- Galuardi, B. and D.M. Stone. 2003. Humpback Chub Catch Rates in Non-baited, Scented, and Baited Nets in the Little Colorado River. 24<sup>th</sup> Annual Upper Basin Researchers Meeting, Grand Junction, CO.
- Jacks, L.S. 2003. Careers in Natural Resource Management and the U.S. Fish & Wildlife Service. The Annual San Carlos Youth Conference, San Carlos, AZ.
- Jacks, L.S. 2003. Current Status and The Future of the Service's Fisheries Program from a Project Leader's View. U.S. Fish and Wildlife Service, National Fisheries Leadership Conference. Washington DC.
- Jacks, L.S. 2003. Preventing the Spread of Aquatic Nuisance Species with the HACCP (Hazard Analysis Critical Control Point) Approach, How the Service is Living It. Aquaculture America - World Aquaculture Society National Meeting, Louisville, KY.
- Jacks, L.S. 2003. The Use of the Hazard Analysis Critical Control Point Process to Control the Spread of Aquatic Nuisance Species. CO/WY/UT American Fisheries Society Annual Meeting, Grand Junction, CO.
- Jacks, L.S. 2003. Tools Needed for a Career in the U.S. Fish & Wildlife Service. University of Arizona Bio-politics Seminar, Tucson, AZ.
- Jann, D.B. 2003. Management of a Native Fish Refuge in the Lower Colorado Flood Plain. Colorado River Aquatic Biologists Annual Meeting, Laughlin, NV.
- Jann, D.B. 2003. Management of a Native Fish Refuge in the Lower Colorado Flood Plain. 24<sup>th</sup> Annual Upper Basin Researchers Meeting, Grand Junction, CO.
- Minckley, C.O., M.S. Thorson, G. Mueller, & J. Carpenter. 2002. High Levee Pond, A Native Fish Habitat Along the Lower Colorado River. 34<sup>th</sup> Annual Desert Fishes Council Meeting, San Luis Potosi, Mex.

## Appendix D. (continued)

- Parker, D. 2003. Arizona Fishery Resources Office, Activities in Arizona. White Mountain Apache Tribe Earth Day Celebration, Whiteriver, AZ.
- Ruiz, L.D. 2003. Application of Fintrol (Antimycin A) for the Recovery of Apache Trout. White Mountain Apache Tribal Plan & Project Review Meeting, Hon-Dah, AZ
- Ruiz, L.D. 2003. Application of Fintrol for the Recovery of the Apache Trout. White Mountain Apache Tribe - Wildlife and Outdoor Recreation Division Meeting, Whiteriver, AZ.
- Ruiz, L.D. 2003. Population Estimates of Apache Trout in 11 Streams on the Fort Apache Indian Reservation. AZ/NM American Fisheries Society Annual Meeting, Gallup, NM.
- Ruiz, L.D. 2003. Recovery Status of Apache Trout: Overview of the Apache Trout Recovery Program. White Mountain Apache Tribe - Wildlife and Outdoor Recreation Division Meeting, Whiteriver, AZ.
- Simmonds, R.L. and S.L. Simmonds. 2003. Biology and Fisheries Management. White Mountain Montessori School, Pinetop, AZ.
- Sponholtz, P.J. 2002. Mission and Vision of the U.S. Fish & Wildlife Service and Arizona Fishery Resources Office. University of Arizona, Master Watershed Stewardship Training, Tucson, AZ.
- Sponholtz, P.J. 2003. 2002 Native Fish Monitoring in the Little Colorado River, Grand Canyon, AZ. Colorado River Aquatic Biologists Annual Meeting, Laughlin, NV.
- Sponholtz, P.J. 2003. Native Fish Monitoring Efforts in the Little Colorado River, AZ. Western Division American Fisheries Society Meeting, San Diego, CA.
- Sponholtz, P.J. 2003. Reservoir Sampling on the Navajo Nation, August 2002. AZ/NM American Fisheries Society Annual Meeting, Gallup, NM.
- Sponholtz, P.J. 2003. The Roles and Responsibilities of the U.S. Fish & Wildlife Service and the Fishery Management Projects of the Arizona Fishery Resources Office. Verde River Citizen's Alliance, Cottonwood, AZ.
- Sponholtz, P.J. and B. Galuardi. 2003. GIS Monitoring of Humpback Chub in the Little Colorado River. AZ/NM American Fisheries Society Annual Meeting, Gallup, NM.
- Sponholtz, P.J. and S. Hedwall. 2003. Overview of the Native Fish and Habitat Issues Associated with the Fossil Creek Diversion Decommissioning. Fossil Creek Volunteers Meeting, Verde River, AZ.
- Stone, D.M. 2003. Humpback Chub Catch Rates in Non-baited, Scented, and Baited Nets in the Little Colorado River. Grand Canyon Monitoring & Research Center Researcher's Meeting, Flagstaff, AZ.
- VanHaverbeke, D.R. 2003. Native Fish Monitoring Efforts in the Little Colorado River, Grand Canyon, Arizona. AZ/NM American Fisheries Society Annual Meeting, Gallup, NM.
- VanHaverbeke, D.R. 2003. Stock Assessment Activities in the Little Colorado River Within Grand Canyon 2002. 24<sup>th</sup> Annual Upper Basin Researchers Meeting, Grand Junction, CO.
- VanHaverbeke, D.R. 2003. The U.S. Fish & Wildlife Service, Arizona Fishery Resources Office, and Native Fish Management in Arizona. Flagstaff Lions Club Meeting, Flagstaff, AZ.

## Appendix E.

## AZFRO Organizational Chart



\*Permanent, non-based funded positions

\*\*Non-permanent, non-based funded positions



## Arizona Fishery Resources Office

### Our Mission:

*“Working with others to conserve, protect, and enhance fish and other aquatic organisms and their habitats in Arizona and the Southwest”*

For additional information regarding the Arizona Fishery Resources Office or any of the accomplishments highlighted within this report, please feel free to contact us at one of our four Arizona locations:

#### **AZFRO-Pinetop**

PO Box 39  
Pinetop, AZ 85935  
(928) 367-1953

#### **AZFRO-San Carlos**

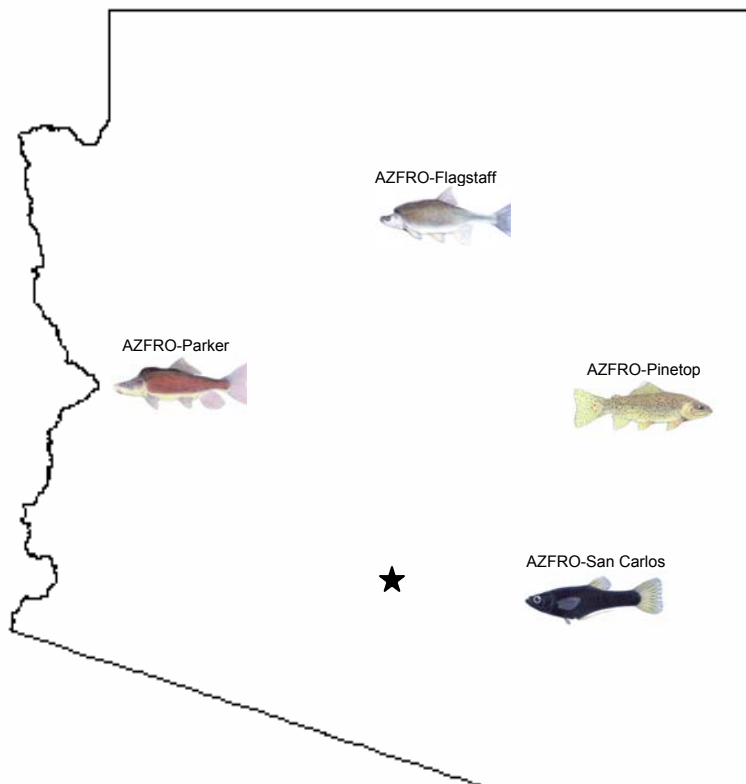
PO Box 710  
Peridot, AZ 85542  
(928) 475-2554

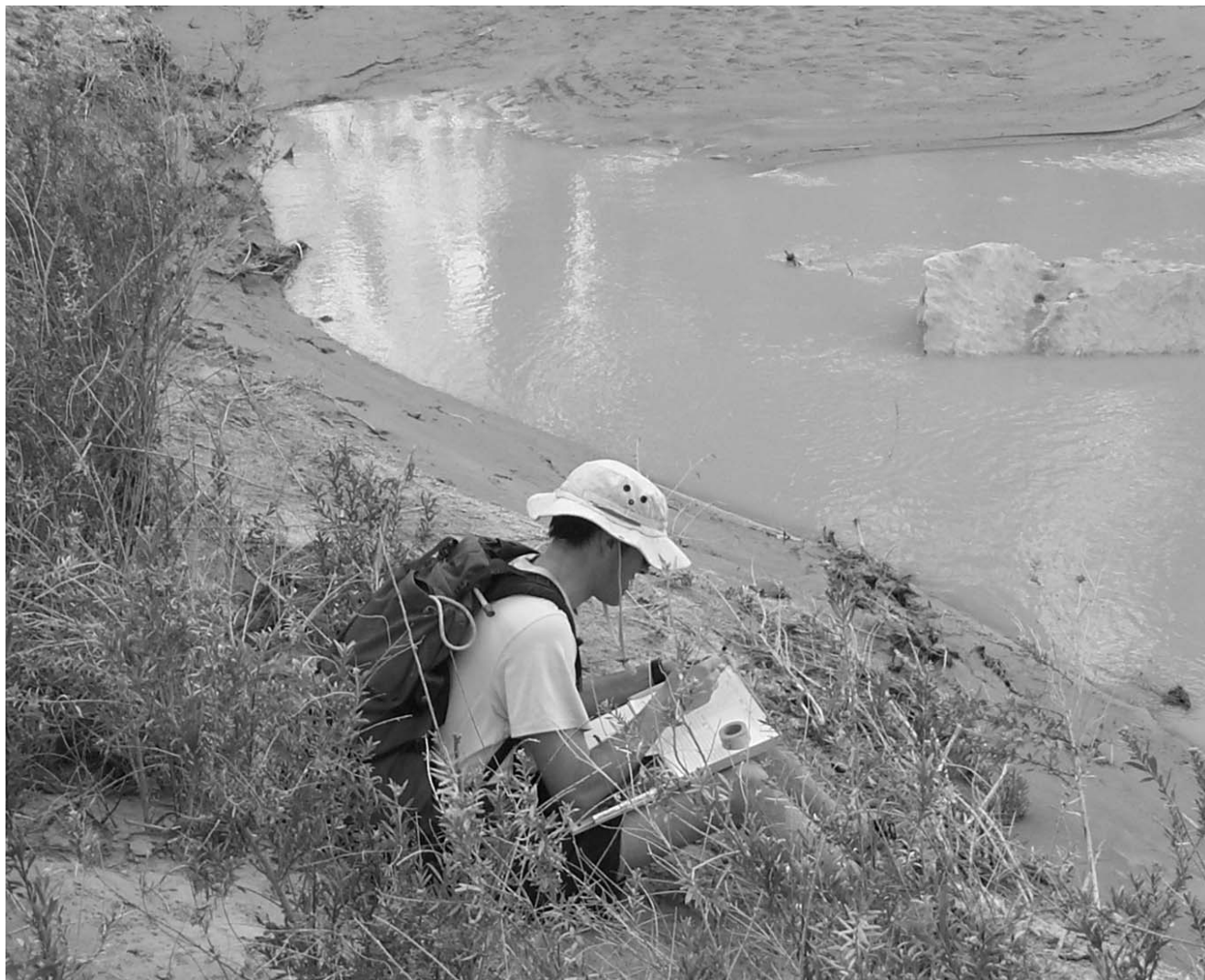
#### **AZFRO-Parker**

60911 Highway 95  
Parker, AZ 85344  
(928) 667 4785

#### **AZFRO-Flagstaff**

PO Box 338  
Flagstaff, AZ 86002  
(928) 226-1289





USFWS

*Recording humpback chub data on the Little Colorado River, Grand Canyon, AZ.*

